

REMARKS

Entry of the foregoing and reconsideration of the application identified in caption, as amended, in light of the remarks which follow, are respectfully requested.

Claim 23 has been amended to recite that the blend of carbon black and silica is in an amount between 30 phr and 50 phr. This amendment is supported by the specification, for example, Tests 8 and 14 in Tables 3 and 5, respectively. In addition, claim 35 has been amended to be consistent with the amendment to claim 1. Further, claim 28 has been amended to change its dependency. Moreover, claim 29 has been amended to further recite that the rubber composition does not contain carbon black. This amendment is supported by the specification, for example, page 3, lines 18-20; page 5, 2nd full paragraph; and Tests 5-7, 13, 18 and 19. Claims 43 and 44 have been added. Claims 43 and 44 are supported by the specification, for example, Tests 1-19.

No new matter has been added. Upon entry of the Amendment, claims 23-44 will by all of the claims pending in the application.

I. Response to Claim Objection

Claim 35 has been objected to as allegedly being of improper dependent form.

Applicant respectfully submits that claim 35 as amended is proper. Specifically, claim 35 has been amended to recite that the blend of carbon black and silica is present in an amount between 30 phr and 45 phr. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the objection.

II. Response to Rejection under 35 U.S.C. § 112, first paragraph

Claims 23-42 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Applicant respectfully submits that the claims as amended are in compliance with the § 112 requirements.

In the Amendment, independent claim 23 has been amended to recite that the blend of carbon black and silica is in an amount between 30 phr and 50 phr. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the § 112 rejection.

III. Response to Rejections under 35 U.S.C. §103(a)

a. Claims 29-32 and 42 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 5,394,919 ("Sandstrom") in view of JP 09302146 ("JP '146"). Applicant respectfully traverses the rejection for the reasons of record and the following additional reasons.

Independent claim 29 recites a pneumatic tire comprising a rubber composition which comprises, *inter alia*, as a reinforcing filler, precipitated or pyrogenic silica, and which *does not contain carbon black*.

Sandstrom discloses a laminate of rubber comprising a reinforcing element having a metal surface and a rubber bonded thereto. The rubber comprises an elastomer, carbon black, optionally silica, dithiodipropionic acid and a methylene donor material (Abstract; col. 2, lines 19-30). In the composition of Sandstrom, carbon black is an essential component. Sandstrom does not disclose or suggest a composition not containing carbon black.

JP '146 is relied upon merely as teaching a specific surface area of carbon black and thus does not rectify the deficiencies of Sandstrom. As such, even if JP '146 and Sandstrom are combined, the combination still would not result in the subject matter of present claim 29.

Furthermore, Sandstrom describes that the composition comprises: (1) 100 parts by weight of at least one diene-based elastomer, (2) about 30 to about 85 phr, optionally about 40 to about 75 phr, of a carbon black, (3) about 0 to about 40 phr, optionally about 5 to about 25 phr, of silica, (4) about 0.1 to about 10, preferably about 0.5 to about 5, phr of dithiodipropionic acid, and (5) about 1 to 5, preferably about 2.5 to about 4.0, phr of at least one methylene donor, wherein the combined weight of carbon black and silica, if used, is in a range of about 40 to about 95 phr (col. 2, lines 23-30 and 39-41).

The composition of JP '146 contains : (1) 100 parts by weight of a diene-based rubber, (2) 0 to 50 pts of a carbon black, (3) 20 to 150 pts of silica, and (4) 5-15 wt%, based on the silica, of an organosilane compound, wherein the sum of carbon black and silica is 50-150 pts (Abstract). JP '146 also describes that carbon black desirably has specific surface area of 50 to 150 m²/g (paragraph [0010]). When the specific surface area is less than 50 m²/g, sufficient hardness as a bead filler cannot be obtained; when specific surface area exceeds 150 m²/g, rolling resistance decreases (paragraph [0010]).

It is apparent that the rubber compositions of Sandstrom and JP '146 have different contents. Particularly, in the composition of Sandstrom, carbon black is an essential element while silica is optional. On the contrary, in the composition of JP '146, silica is an essential element while carbon black is optional. Additionally, the effects of the amount of carbon black described in JP '146 are specific to the composition of JP '146. As such, it would not have been obvious to one of ordinary skill in the art that substitution of the carbon black described in JP '146 for the carbon black in Sandstrom would obtain predictable results. That is, it would not have been obvious that substitution of the carbon black described in JP '146 for the carbon black in Sandstrom would provide sufficient hardness and rolling resistance.

For at least this reason, there would not have been motivation to combine Sandstrom and JP '146. See M.P.E.P. § 2141.III.

In view of the foregoing, Applicant respectfully submits that claim 29 is not obvious over Sandstrom in view of JP '146. Additionally, claims 30-32 and 42 depend from claim 29, directly or indirectly, and thus are patentable over the cited references at least by virtue of their dependency.

b. Claim 33 has been rejected under 35 U.S.C. § 103(a) as allegedly obvious over Sandstrom in view of JP '146, and further in view of U.S. Patent No. 6,008,295 ("Takeichi"). Applicant respectfully traverses the rejection for the reasons set forth above in Section III.a.

Further, Takeichi is relied upon merely as disclosing the use of silicon or tin halide modified diene elastomer, and thus does not rectify the deficiencies of Sandstrom and JP '146. As such, even if Takeichi, Sandstrom and JP '146 are combined, the combination still would not result in the subject matter of claim 33. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

c. Claim 34 has been rejected under 35 U.S.C. § 103(a) as allegedly obvious over Sandstrom in view of JP '146 and further in view of U.S. Patent No. 5,844,050 ("Fukahori"). Applicant respectfully traverses the rejection for the reasons set forth above in Section III.a.

Further, Fukahori is relied upon merely as disclosing a diene elastomer comprising a majority of cis-1,4 bonds, which is branched using divinylbenzene, and thus does not rectify the deficiencies of Sandstrom and JP '146. As such, even if Fukahori, Sandstrom and JP '146 are combined, the combination still would not result in the subject matter of claim 34. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

d. Claims 37-40 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over Sandstrom in view of JP '146, and further in view of U.S. Patent No. 6,211,278

("Vanel"). Applicant respectfully traverses the rejection for the reasons set forth above in Section III.a.

Further, Vanel is relied upon merely as disclosing the use of a covering agent that is alkoxyalkyl silane, and thus does not rectify the deficiencies of Sandstrom and JP '146. As such, even if Vanel, Sandstrom and JP '146 are combined, the combination still would not result in the subject matter of claims 37-40. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

e. Claims 23-25, 29-31 and 35-37 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 6,776,206 ("Segatta") in view of JP '146. Applicant respectfully traverses the rejection for the reason of record and the following additional reasons.

1. Claims 23-25 and 35-37

Independent claim 23 recites a pneumatic tire comprising a rubber composition which comprises, *inter alia*, as a reinforcing filler, a blend of carbon black having a BET specific surface area of between 30 and 160 m²/g and of precipitated or pyrogenic silica having a specific surface area of between 30 and 260 m²/g, wherein *the amount of silica is greater than the amount of carbon black*, the blend of carbon black and silica is in an amount between 30 phr and 50 phr, and the amount of silica is from 25 phr to 40 phr.

This recited rubber composition can provide unexpected results. Specifically, the specification describes in Table 2, Tests 1 and 2 (Example) and Tests 3 and 4 (Control). Tests 1 and 2 each contains 35 phr UVN3 (silica) and 5 phr Black N330 (carbon black). That is, Tests 1 and 2 contain more silica than carbon black, and are within the scope of claim 23. Test 3 contains a blend of 15 phr UVN3 and 40 phr Black N347 (carbon black). Test 4 contains 35 phr Black N330 and no silica. That is, Tests 3 and 4 contain more carbon black

than silica, and fall outside the range recited in claim 23. Further, Test 3 contains a total amount of 55 phr of the blend, which is also outside the range recited in claim 23. The results in Table 2 show that Tests 1 and 2 are superior to Tests 3 and 4, in terms of tearability and hysteresis properties.

Segatta discloses a rubber composition containing at least one diene rubber, a trans 1,4-polybutadiene rubber, carbon black in an amount of about 20 to about 200 phr of diene rubber and optionally silica in an amount of about 5 to about 25 phr (Abstract; col. 3, line 66-col. 4, line 4). In the composition of Segatta, carbon black is an essential component. Segatta does not disclose a composition wherein *the amount of silica is greater than the amount of carbon black*, as recited in present claim 23.

JP '146 is relied upon merely as teaching a specific surface area of carbon black and thus does not rectify the deficiencies of Segatta. As such, even if JP '146 and Segatta are combined, the combination still would not result in the subject matter of present claim 23. In addition, neither Segatta nor JP '146 discloses or suggests the above-mentioned superior results achievable in the presently claimed composition.

Furthermore, Segatta describes that the composition comprises: (1) about 80 to about 97 parts by weight of at least one diene rubber, (2) about 3 to about 20 pts of a trans 1,4-polybutadiene rubber, (3) about 20 to about 200 phr of a carbon black, and (4) about 5 to about 25 phr of silica (claim 1; col. 3, line 66-col. 4, line 4).

The composition of JP '146 contains : (1) 100 parts by weight of a diene-based rubber, (2) 0 to 50 pts of a carbon black, (3) 20 to 150 pts of silica, and (4) 5-15 wt%, based on the silica, of an organosilane compound, wherein the sum of carbon black and silica is 50-150 pts (Abstract). JP '146 also describes that carbon black desirably has specific surface area of 50 to 150 m²/g (paragraph [0010]). When the specific surface area is less than 50 m²/g,

sufficient hardness as a bead filler cannot be obtained; when specific surface area exceeds $150 \text{ m}^2/\text{g}$, rolling resistance decreases occurs (paragraph [0010]).

It is apparent that the rubber compositions of Segatta and JP '146 have different contents. Particularly, in the composition of Segatta, carbon black is an essential element while silica is optional. On the contrary, in the composition of JP '146, silica is an essential element while carbon black is optional. Additionally, the effects of the amount of carbon black described in JP '146 are specific to the composition of JP '146. As such, it would not have been obvious to one of ordinary skill in the art that substitution of the carbon black described in JP '146 for the carbon black in Segatta would obtain predictable results. That is, it would not have been obvious that substitution of the carbon black described in JP '146 for the carbon black in Segatta would provide sufficient hardness and rolling resistance. For at least this reason, there would not have been motivation to combine Segatta and JP '146. See M.P.E.P. § 2141.III.

In view of the foregoing, Applicant respectfully submits that claim 23 is not obvious over Segatta in view of JP '146. Additionally, claims 24, 25 and 35-37 depend from claim 23, directly or indirectly, and thus are patentable over the cited references at least by virtue of their dependency.

2. Claims 29-31

Independent claim 29 recites a pneumatic tire comprising a rubber composition which comprises, *inter alia*, as a reinforcing filler, precipitated or pyrogenic silica, and which *does not contain carbon black*.

Segatta discloses a rubber composition containing at least one diene rubber, a trans 1,4-polybutadiene rubber, carbon black in an amount of about 20 to about 200 phr of diene rubber and optionally silica in an amount of about 5 to about 25 phr (Abstract; col. 3, line 66-

col. 4, line 4). In the composition of Segatta, carbon black is an essential component.

Segatta does not disclose or suggest a composition not containing carbon black.

JP '146 is relied upon merely as teaching a specific surface area of carbon black and thus does not rectify the deficiencies of Segatta. As such, even if JP '146 and Segatta are combined, the combination still would not result in the subject matter of present claim 29.

Furthermore, Segatta describes that the composition comprises: (1) about 80 to about 97 parts by weight of at least one diene rubber, (2) about 3 to about 20 pts of a trans 1,4-polybutadiene rubber, (3) about 20 to about 200 phr of a carbon black, and (4) about 5 to about 25 phr of silica, if used (claim 1; col. 3, line 66-col. 4, line 4).

The composition of JP '146 contains : (1) 100 parts by weight of a diene-based rubber, (2) 0 to 50 pts of a carbon black, (3) 20 to 150 pts of silica, and (4) 5-15 wt%, based on the silica, of an organosilane compound, wherein the sum of carbon black and silica is 50-150 pts (Abstract). JP '146 also describes that carbon black desirably has specific surface area of 50 to 150 m²/g (paragraph [0010]). When the specific surface area is less than 50 m²/g, sufficient hardness as a bead filler cannot be obtained; when specific surface area exceeds 150 m²/g, rolling resistance decreases occurs (paragraph [0010]).

It is apparent that the rubber compositions of Segatta and JP '146 have different contents. Particularly, in the composition of Segatta, carbon black is an essential element while silica is optional. On the contrary, in the composition of JP '146, silica is an essential element while carbon black is optional. Additionally, the effects of the amount of carbon black described in JP '146 are specific to the composition of JP '146. As such, it would not have been obvious to one of ordinary skill in the art that substitution of the carbon black described in JP '146 for the carbon black in Segatta would obtain predictable results. That is, it would not have been obvious that substitution of the carbon black described in JP '146 for

the carbon black in Segatta would provide sufficient hardness and rolling resistance. For at least this reason, there would not have been motivation to combine Segatta and JP '146. See M.P.E.P. § 2141.III.

In view of the foregoing, Applicant respectfully submits that claim 29 is not obvious over Segatta in view of JP '146. Additionally, claims 30 and 31 depend from claim 29, directly or indirectly, and thus are patentable over the cited references at least by virtue of their dependency.

f. Claims 26, 27, 32 and 33 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over Segatta in view of JP '146, and further in view of Takeichi. Applicant respectfully traverses the rejection for the reasons set forth above in Section III.e.

Further, Takeichi is relied upon merely as disclosing the use of silicon or tin halide modified diene elastomer, and thus does not rectify the deficiencies of Segatta and JP '146. As such, even if Takeichi, Segatta and JP '146 are combined, the combination still would not result in the subject matter of claims 26, 27, 32 and 33. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

g. Claims 26, 28, 32 and 34 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over Segatta in view of JP '146, and further in view of Fukahori. Applicant respectfully traverses the rejection for the reasons set forth above in Section III.e.

Further, Fukahori is relied upon merely as disclosing a diene elastomer comprising a majority of cis-1,4 bonds, which is branched using divinylbenzene, and thus does not rectify the deficiencies of Segatta and JP '146. As such, even if Fukahori, Segatta and JP '146 are combined, the combination still would not result in the subject matter of claims 26, 28, 32 and 34. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

h. Claims 38-40 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over Segatta in view of JP '146, and further in view of Vanel. Applicant respectfully traverses the rejection for the reasons set forth above in Section III.e.

Further, Vanel is relied upon merely as disclosing the use of a covering agent that is alkoxyalkyl silane, and thus does not rectify the deficiencies of Segatta and JP '146. As such, even if Vanel, Segatta and JP '146 are combined, the combination still would not result in the subject matter of claims 38-40. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

i. Claims 41 and 42 have been rejected under 35 U.S.C. § 103(a) as allegedly obvious over Segatta in view of JP '146. Applicant respectfully traverses the rejection for the reasons set forth above in Section III.e.

IV. New Claims

Claims 43 and 44 depend from claim 23 and further recite that the carbon black is present in an amount of 15 phr or less and 5 phr or less, respectively. Applicant submits that claims 43 and 44 are patentable over the cited references at least for the same reasons set forth above with respect to claim 23.

Further, Sandstrom discloses a composition comprising, *inter alia*, about 30 to about 85 phr, optionally about 40 to about 75 phr, of carbon black. In addition, Segatta discloses a composition comprising, *inter alia*, about 20 to about 200 phr of carbon black. Neither Sandstrom nor Segatta discloses or suggests a composition containing 15 phr or less, or 5 phr or less, of carbon black. As such, even if Sandstrom or Segatta is combined with the cited secondary references, in the manner as suggested by the Examiner, the combinations still would not result in the subject matter of claims 43 and 44.

In view of the foregoing, Applicants respectfully submit that claims 43 and 44 are patentable over the cited references.


V. Conclusion

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (202) 452-7932 at her earliest convenience.

Respectfully submitted,

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